U.S. National Phase of PCT/AU00/00189

New Claims and Redlined Version of Amended Claims

1. (Amended) An isolated and purified nucleic acid sequence comprising a polynucleotide sequence encoding a polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, wherein said antibody ~~(~~, or fragment thereof~~)~~ , has binding affinity to a p53 protein or a portion thereof in vertebrates, and wherein said nucleic acid sequence is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease.

2. (Amended) ~~A~~ The nucleic acid sequence according to claim 1, wherein said immune response is ~~characterised~~ characterized by expression of at least one p53 antibody.

3. (Amended) ~~A~~ The nucleic acid sequence according to claim 1 ~~or claim 2~~ comprising a polynucleotide sequence encoding an F_{ab} antibody fragment ~~(~~, or fragment thereof,~~)~~ having binding affinity to a p53 protein or a portion thereof in vertebrates.

4. (Amended) An isolated and purified nucleic acid sequence encoding a polypeptide of an antibody ~~(~~, or fragment thereof,~~)~~ comprising a polynucleotide sequence selected from the group consisting of SEQ ID Nos 1-30, wherein said antibody ~~(~~, or fragment thereof,~~)~~ has binding affinity to a p53 protein or a portion thereof.

5. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~ claim ~~1 to 4~~, wherein the nucleic acid sequence is DNA.

6. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~ claim ~~1 to 4~~, wherein the nucleic acid sequence is RNA.

7. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~ claim ~~1 to 6~~, wherein the nucleic acid sequence comprises a polynucleotide sequence~~(s)~~ or sequences, or an analogue thereof, encoding an antibody fragment or other immunologically active fragment thereof, ~~-~~wherein the antibody ~~(~~, or fragment thereof,~~)~~ has binding affinity to a p53 protein or a portion thereof in vertebrates.

8. (Amended) ~~A~~ The nucleic acid sequence according to claim 7, wherein the antibody fragment or other immunologically active fragment comprises at least one complementarity determining region.

9. (Amended) ~~A~~ The nucleic acid sequence according to claim 7 ~~or claim 8~~, wherein the antibody fragment comprises at least one functional antigen-binding domain.

10. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 7 ~~to 9~~, wherein the antibody fragment is selected from the group consisting of: Fv, F_{ab}, $F(ab)_2$, scFv (single chain Fv), dAb (single domain antibody), bi-specific antibodies, diabodies and triabodies.

11. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 10~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues of one or more of the N-terminus, the C-terminus or the central domain of a p53 protein or a portion thereof.

12. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 11~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues of the N-terminus of a p53 protein or a portion thereof.

13. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 12~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues about 10 to about 55 of the N-terminus of a p53 protein or portion thereof.

14. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 12~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues about 10 to about 25 of the N-terminus of a p53 protein or portion thereof.

15. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 12~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues about 40 to about 50 of the N-terminus of a p53 protein or portion thereof.

16. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 12~~, wherein the antibody ~~(~~, or fragment thereof~~,)~~ has binding affinity for residues about 27 to about 44 of the N-terminus of a p53 protein or portion thereof.

17. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 12~~, wherein the antibody ~~(~~, or fragment thereof~~)~~, has binding affinity for residues about 40 to about 44 of the N-terminus of a p53 protein or portion thereof.

18. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 11~~, wherein the antibody ~~(~~, or fragment thereof~~)~~, has binding affinity for residues of the central domain of a p53 protein or a portion thereof.

19. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 18~~, wherein said sequence comprises a polynucleotide sequence encoding a polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said polynucleotide sequence encodes an immunoglobulin light chain variable region polypeptide or an immunoglobulin heavy chain variable region polypeptide.

20. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 19~~, wherein said sequence comprises a polynucleotide sequence encoding a polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said nucleic acid sequence comprises a first polynucleotide sequence encoding an immunoglobulin light chain variable region polypeptide, and a second polynucleotide sequence encoding an immunoglobulin heavy chain variable region polypeptide.

21. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 20~~, wherein the vertebrate is selected from the group consisting of human, non-human primate, murine, bovine, ovine, equine, caprine, leporine, avian, feline and canine.

22. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 21~~, wherein the vertebrate is human.

23. (Amended) An isolated and purified nucleic acid sequence comprising an analogue of the nucleic acid sequence according ~~to any one of claims~~claim 1 ~~to 22~~, wherein said analogue encodes a polypeptide having a biological activity which is functionally the same as the polypeptide(s) encoded by said polynucleotide sequence.

24. (Amended) ~~A~~ The nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 23~~, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

25. (Amended) ~~A~~ The nucleic acid sequence according to claim 24, wherein the disease is cancer.

26. (Amended) ~~A~~ The nucleic acid sequence according to claim 25, wherein the cancer is selected from the group consisting of carcinogenic ~~tumour~~tumors; ~~tumour~~tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck ~~tumour~~tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal ~~tumour~~tumors, such as sarcoma; and haemopoietic ~~tumour~~tumors, such as B cell lymphoma.

27. (Amended) A polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said polypeptide is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease.

28. (Amended) ~~A~~ The polypeptide according to claim 27, wherein said immune response is ~~characterised~~characterized by expression of at least one p53 antibody.

29. (Amended) An isolated and purified polypeptide, wherein said polypeptide is encoded by the nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 26~~.

30. (Amended) An isolated and purified polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, comprising an amino acid sequence selected from the group consisting of SEQ ID Nos 31-60, wherein said antibody ~~(~~, or fragment thereof~~)~~, has binding affinity to a p53 protein or a portion thereof.

31. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 30~~, wherein said polypeptide is selected from the group consisting of: Fv, F_{ab}, $F(ab)_2$, scFv (single chain Fv), dAb (single domain antibody), bi-specific antibodies, diabodies and triabodies.

32. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 31~~, wherein said polypeptide has binding affinity to a p53 protein or a portion thereof.

33. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 32~~, wherein said polypeptide has binding affinity for residues of one or more of the N-terminus, the C-terminus or the central domain of a p53 protein or a portion thereof.

34. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 33~~, wherein said polypeptide has binding affinity for residues of the N-terminus of a p53 protein or a portion thereof.

35. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 34~~, wherein said polypeptide has binding affinity for residues about 10 to about 55 of the N-terminus of a p53 protein or portion thereof.

36. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 34~~, wherein said polypeptide has binding affinity for residues about 10 to about 25 of the N-terminus of a p53 protein or portion thereof.

37. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 34~~, wherein said polypeptide has binding affinity for residues about 40 to about 50 of the N-terminus of a p53 protein or portion thereof.

38. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 34~~, wherein said polypeptide has binding affinity for residues about 27 to about 44 of the N-terminus of a p53 protein or portion thereof.

39. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 34~~, wherein said polypeptide has binding affinity for residues about 40 to about 44 of the N-terminus of a p53 protein or portion thereof.

40. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~claim 27 ~~to 33~~, wherein said polypeptide has binding affinity for residues of the central domain of a p53 protein or a portion thereof.

41. (Amended) An isolated and purified polypeptide, wherein said polypeptide is a homologous polypeptide of the polypeptide according to ~~any one of claims~~claim 27 ~~to 40~~.

42. (Amended) ~~A~~ The polypeptide according to claim 41, wherein said polypeptide is at least 45% homologous to ~~the~~ a polypeptide ~~according to any one of claims 27 to 40~~ of an antibody, or fragment thereof, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said polypeptide of an antibody is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease.

43. (Amended) ~~A~~ The polypeptide according to claim 41, wherein said polypeptide is at least 75% homologous to the polypeptide of an antibody, or fragment thereof, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said polypeptide of an antibody is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease ~~according to any one of claims 27 to 40~~.

44. (Amended) ~~A~~ The polypeptide according to claim 41, wherein said polypeptide is at least 95-99% homologous to the polypeptide of an antibody, or fragment thereof, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said polypeptide of an antibody is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease ~~according to any one of claims 27 to 40~~.

45. (Amended) ~~A~~ The polypeptide according to ~~any one of claims~~ claim 27 ~~to 44~~, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

46. (Amended) ~~A~~ The polypeptide according to claim 45, wherein the disease is cancer.

47. (Amended) ~~A~~ The polypeptide according to claim 46, wherein the cancer is selected from the group consisting of carcinogenic ~~tumour~~tumors; ~~tumour~~tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck ~~tumour~~tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal ~~tumour~~tumors, such as sarcoma; and haemopoietic ~~tumour~~tumors, such as B cell lymphoma.

49. (Amended) ~~A~~ The peptide fragment according to claim 48, wherein said peptide fragment comprises between about 5 and about 50 contiguous amino acids of any one of SEQ ID Nos 31-60.

50. (Amended) ~~A~~ The peptide fragment according to ~~any one of claims~~claim ~~48 to 49~~, wherein said peptide fragment comprises between about 5 and about 30 contiguous amino acids of any one of SEQ ID Nos 31-60.

51. (Amended) ~~A~~ The peptide fragment according to ~~any one of claims~~claim ~~48 to 50~~, wherein said peptide fragment comprises between about 8 and about 20 contiguous amino acids of any one of SEQ ID Nos 31-60.

52. (Amended) ~~A~~ The peptide fragment according to claim 48, wherein said peptide fragment is derived from the complementarity determining region.

53. (Amended) ~~A~~ The peptide fragment according to ~~any one of claims~~claim ~~48 to 52~~, wherein said immune response is an idiotypic response.

54. (Amended) ~~A~~ The peptide fragment according to ~~any one of claims~~claim ~~48 to 53~~, wherein the vertebrate is human.

56. (Amended) ~~An~~ The antibody or fragment thereof according to claim 55, wherein said immune response is ~~characterised~~characterized by expression of a p53 antibody.

57. (Amended) ~~An~~ The antibody, or fragment thereof, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said antibody or fragment thereof is comprised of the polypeptide according to ~~any one of claims~~claim ~~27 to 47~~.

58. (Amended) ~~An~~ The antibody, or fragment thereof, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said antibody or fragment thereof is encoded by the nucleic acid sequence according to ~~any one of claims~~claim ~~1 to 26~~.

59. (Amended) ~~An~~ The antibody fragment according to ~~any one of claims~~claim ~~55 to 58~~, wherein said fragment is an immunologically active fragment.

60. (Amended) ~~An~~ The antibody fragment according to ~~any one of claims~~claim ~~55 to 59~~, wherein said fragment comprises at least one complementarity determining region.

61. (Amended) ~~An~~ The antibody fragment according to ~~any one of claims~~claim ~~55 to 60~~, wherein said fragment is selected from the group consisting of: Fv, F_{ab}, $F(ab)_2$, scFv

(single chain Fv), dAb (single domain antibody), bi-specific antibodies, diabodies and triabodies.

62. (Amended) ~~An~~ The antibody, or fragment thereof, according to ~~any one of claims~~claim 55 ~~to 61~~, which is a polyclonal antibody.

63. (Amended) ~~An~~ The antibody, or fragment thereof, according to ~~any one of claims~~claim 55 ~~to 61~~, which is a monoclonal antibody.

64. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 63~~, wherein said antibody or fragment thereof has binding affinity for residues of one or more of the N-terminus, the C-terminus or the central domain of a p53 protein or a portion thereof.

65. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 64~~, wherein said antibody or fragment thereof has binding affinity for residues of the N-terminus of a p53 protein or a portion thereof.

66. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 65~~, wherein said antibody or fragment thereof has binding affinity for residues about 10 to about 55 of the N-terminus of a p53 protein or portion thereof.

67. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 65~~, wherein said antibody or fragment thereof has binding affinity for residues about 10 to about 25 of the N-terminus of a p53 protein or portion thereof.

68. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 65~~, wherein said antibody or fragment thereof has binding affinity for residues about 40 to about 50 of the N-terminus of a p53 protein or portion thereof.

69. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 65~~, wherein said antibody or fragment thereof has binding affinity for residues about 27 to about 44 of the N-terminus of a p53 protein or portion thereof.

70. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 65~~, wherein said antibody or fragment thereof has binding affinity for residues about 40 to about 44 of the N-terminus of a p53 protein or portion thereof.

71. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 57 ~~to 64~~, wherein said antibody or fragment thereof has binding affinity for residues of the central domain of a p53 protein or a portion thereof.

72. (Amended) ~~An~~ The antibody or fragment thereof according to ~~any one of claims~~claim 55 ~~to 71~~, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

73. (Amended) ~~An~~ The antibody or fragment thereof according to claim 72, wherein the disease is cancer.

74. (Amended) ~~An~~ The antibody or fragment thereof according to claim 73, wherein the cancer is selected from the group consisting of carcinogenic ~~tumour~~tumors; ~~tumour~~tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck ~~tumour~~tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal ~~tumour~~tumors, such as sarcoma; and haemopoietic ~~tumour~~tumors, such as B cell lymphoma.

75. (Amended) A vector comprising the nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 26~~.

76. (Amended) ~~A~~ The vector according to claim 75, wherein said vector is selected from the group consisting of viral, plasmid, bacteriophage, phagemid, cosmid, bacterial artificial chromosome, and yeast artificial chromosome.

77. (Amended) ~~A~~ The vector according to claim 76, wherein said bacteriophage is selected from the group consisting of λgt10 and λgt11 and phage display vectors.

78. (Amended) ~~A~~ The vector according to claim 77, wherein said phage display vector is selected from vectors derived from pCOMB vectors.

79. (Amended) ~~A~~ The vector according to claim 76 ~~or 77~~, wherein said phage display vector is of the MCO group.

80. (Amended) ~~A~~ The vector according to ~~any one of claims~~claim 77 ~~to 79~~, wherein said phage display vector is selected from the group consisting of MCO1, MCO3 and MCO6 vectors.

81. (Amended) ~~A~~ The vector according to ~~any one of claims~~claim 77 ~~to 80~~, wherein said phage display vector is MCO3.

82. (Amended) ~~A~~ The vector according to claim 75, wherein said vector is a mammalian expression vector.

83. (Amended) ~~A~~ The vector according to claim 82, wherein said mammalian expression vector is pG1D102-MCO or pKN100-MCO.

84. (Amended) A host cell transformed with the vector according to ~~any one of claims~~claim 75 ~~to 83~~.

85. (Amended) ~~A~~ The host cell according to claim 84, wherein said host cell is selected from the group consisting of *E. coli, Bacillus, Streptomyces, Pseudomonas, Salmonella,* and *Serratia.*

86. (Amended) ~~A~~ The host cell according to claim 84, wherein said host cell is selected from the group consisting of yeast, fungi, plant, insect cells and mammalian cells.

87. (Amended) ~~A~~ The host cell according to claim 86, wherein said mammalian cells are selected from the group consisting of CHO cell lines, COS cell lines, HeLa cells, L cells, murine 3T3 cells, c6 glioma cells and myeloma cell lines.

88. (Amended) ~~A~~ The host cell according to claim 86 ~~or claim 87~~, wherein said mammalian cells are CHO DG44 cells.

89. (Amended) A non-human vertebrate comprising a host cell according to ~~any one of claims~~claim 84 ~~to 88~~.

90. (Amended) A pharmaceutical composition comprising the polypeptide according to ~~any one of claims~~claim 27 ~~to 47, or a peptide fragment according to any one of claims 48 to 54, or an antibody or fragment thereof according to any one of claims 55 to 74,~~ together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

91. (Amended) ~~A~~ The pharmaceutical composition according to claim 90, wherein said polypeptide is in a form selected from the group consisting of polypeptide/chelate, polypeptide/drug, polypeptide/prodrug, polypeptide/toxin, polypeptide/imaging marker, antibody/chelate, antibody/drug, antibody/prodrug, antibody/toxin and antibody/imaging marker.

92. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said chelate is selected from the group consisting of: ^{90}Y, ^{131}I and ^{188}Re.

93. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said drug is a cytotoxic drug.

94. (Amended) ~~A~~ The pharmaceutical composition according to claim 93, wherein said cytotoxic drug is selected from the group consisting of adriamycin, melphalan, cisplatin, taxol, fluorouricil, cyclophosphamide

95. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said prodrug is an antibody directed prodrug therapy or ADEPT.

96. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said toxin is selected from the group consisting of ricin, abrin, *Diptheria* toxin and *Pseudomonas* endotoxin (PE 40).

97. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said imaging marker is selected from the group consisting of ^{125}I, ^{131}I, ^{123}I, ^{111}In, ^{105}Rh, ^{153}Sm, ^{67}Cu, ^{67}Ga, ^{166}Ho, ^{177}Lu, ^{186}Re, ^{188}Re, and ^{99m}Tc.

98. (Amended) ~~A~~ The pharmaceutical composition according to claim 91, wherein said imaging marker is gadolinium.

99. (Amended) A vaccine comprising a nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 26~~, or a fragment thereof, ~~or a polypeptide according to any one of claims 27 to 47, or a peptide fragment according to any one of claims 48 to 54, or an antibody or fragment thereof according to any one of claims 55 to 74,~~ together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

100. (Amended) ~~A~~ The vaccine according to claim 99, wherein said vaccine is an idiotypic vaccine.

101. (Amended) ~~A~~ The vaccine according to claim 99 ~~or claim 100~~, wherein said vaccine is formulated for administration via an oral, inhalation, topical or parenteral route.

102. (Amended) A method for inducing an immune response against disease in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the polypeptide ~~(~~, or peptide fragment thereof~~)~~, according to ~~any one of claims~~claim 27 ~~to 47, or a peptide fragment according to any one of claims 48 to 54, or an antibody (or fragment thereof) according to any one of claims 55 to 74, or a pharmaceutical composition according to any one of claims 90 to 98, or a vaccine according to any one of claims 99 to 101~~.

103. (Amended) The method according to claim 102, wherein the polypeptide, peptide fragment, or antibody ~~(~~, or fragment thereof~~)~~, is administered together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

104. (Amended) A method for the treatment and/or prophylaxis of disease in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the polypeptide ~~(~~, or peptide fragment thereof~~)~~, according to ~~any one of claims~~claim 27 ~~to 47, or the peptide fragment according to any one of claims 48 to 54, or an antibody (or fragment thereof) according to any one of claims 55 to 74, or a pharmaceutical composition according to any one of claims 90 to 98, or a vaccine according to any one of claims 99 to 101~~.

105. (Amended) The method according to ~~any one of claims~~claim 102 ~~to 104~~, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

106. (Amended) The method according to ~~any one of claims~~claim 102 ~~to 105~~, wherein the disease is cancer.

107. (Amended) The method according to claim 106, wherein the cancer is selected from the group consisting of carcinogenic ~~tumour~~tumors; ~~tumour~~tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck ~~tumour~~tumors, hepatic

cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal ~~tumour~~tumors, such as sarcoma; and haemopoietic ~~tumour~~tumors, such as B cell lymphoma.

108. (Amended) A diagnostic kit for the detection of polypeptides encoded by the p53 gene in vertebrates, said kit comprising the antibody ~~(~~, or fragment thereof~~)~~, according to ~~any one of claims~~claim 55 ~~to 74~~, together with a diagnostically acceptable carrier and/or diluent.

109. (Amended) ~~A~~ The diagnostic kit according to claim 108, wherein said kit comprises:

(a) a first container containing the antibody ~~(~~, or fragment thereof~~)~~, wherein said antibody or fragment thereof has binding affinity to a p53 protein or a portion thereof in vertebrates, and wherein said antibody is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease.~~according to any one of claims 55 to 74~~, and;

(b) a second container containing a conjugate comprising a binding partner of the antibody ~~(~~, or fragment thereof~~)~~, together with a detectable label.

110. (Amended) A method for screening for a disease in a vertebrate comprising:

(a) contacting a sample from a vertebrate with a nucleic acid probe comprising a nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 26~~, or an oligonucleotide fragment thereof, and

(b) detecting ~~hybridisation~~hybridization between the nucleic acid sample and the polynucleotide sequence.

111. (Amended) ~~A~~ The method according to claim 110, wherein the oligonucleotide fragment is between about 10 to about 100 nucleotides in length.

112. (Amended) ~~A~~ The method according to claim 110 ~~or claim 111~~, wherein the oligonucleotide fragment is between about 15 to about 30 nucleotides in length.

113. (Amended) The method according to ~~any one of claims~~claim 110 ~~to 112~~, wherein ~~hybridisation~~hybridization as compared to non-~~hybridisation~~hybridization is indicative of disease.

114. (Amended) The method according to ~~any one of claims~~claim 110~~ to 113~~, wherein said disease is cancer.

115. (Amended) The method according to ~~any one of claims~~claim 110~~ to 114~~, wherein ~~hybridisation~~hybridization is conducted under low, moderate, or high stringency.

116. (Amended) The method according to ~~any one of claims~~claim 110~~ to 115~~, wherein ~~hybridisation~~hybridization is conducted under high stringency.

117. (Amended) A method for screening for a disease in a vertebrate comprising:

(a) contacting a sample from a vertebrate with the antibody~~(~~, or fragment thereof~~)~~, according to ~~any one of claims~~claim 55~~ to 74~~, and

(b) detecting the presence of the antibody~~(~~, or fragment thereof~~)~~, bound to a p53 polypeptide.

118. (Amended) ~~A~~ The method according to claim 117, wherein said disease is cancer.

119. (Amended) A method of gene therapy, wherein said method comprises:

(a) inserting a nucleic acid sequence according to ~~any one of claims~~claim 1~~ to 26, or a vector according to any one of claims~~claim~~ 75 to 83,~~ into a host cell;

(b) expressing the nucleic acid sequence in the transformed cell.

121. (Amended) A process for preparing an antibody~~(~~, or fragment thereof~~)~~, having binding affinity to a p53 protein or a portion thereof in vertebrates, wherein said process comprises:

(a) isolating from a vertebrate a nucleic acid sequence according to ~~any one of claims~~claim 1~~ to 26~~;

(b) cloning said nucleic acid sequence into a vector;

(c) constructing an antibody fragment library; and

(d) screening said library for clones expressing the antibody of interest.

122. (Amended) The process according to claim 121, wherein said antibody~~(~~, or fragment thereof~~)~~, has binding affinity to a p53 protein or a portion thereof in vertebrates.

125. (Amended) The process according to ~~any one of claims~~claim 121~~ to 124~~, wherein the vector is a phage display vector.

127. (Amended) The process according to claim 125 ~~or claim 126~~, wherein the vector is MCO1.

128. (Amended) A method of locating a nucleotide sequence encoding a polypeptide of an antibody ~~(~~, or fragment thereof~~)~~, having binding affinity to a p53 protein or portion thereof in vertebrates, using the nucleic acid sequence according to ~~any one of claims~~claim 1 ~~to 26~~, or an oligonucleotide fragment thereof.

129. (Amended) The method according to claim 128, comprising:

(a) contacting a biological sample with a nucleic acid sequence ~~according to~~ comprising a polynucleotide sequence encoding a polypeptide of an antibody, or fragment thereof, wherein said antibody, or fragment thereof, has binding affinity to a p53 protein or a portion thereof in vertebrates, and wherein said nucleic acid sequence is obtained from a vertebrate host expressing an immune response against a naturally-occurring disease~~any one of claims~~claim ~~1 to 26~~, or an oligonucleotide fragment thereof; and

(b) identifying nucleotide sequences in the biological sample which ~~hybridise~~ hybridize to said nucleic acid sequence or oligonucleotide fragment.

130. (Amended) ~~A~~ The method according to claim 129, wherein the oligonucleotide fragment is between about 10 to about 100 nucleotides in length.

131. (Amended) ~~A~~ The method according to claim 129 ~~or claim 130~~, wherein the oligonucleotide fragment is between about 15 to about 30 nucleotides in length.

132. (New) A pharmaceutical composition comprising a peptide fragment according to claim 48 together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

133. (New) A pharmaceutical composition comprising an antibody or fragment thereof according to claim 55 together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

134. (New) A vaccine comprising a polypeptide according to claim 27 together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

135. (New) The vaccine according to claim 134, wherein said vaccine is an idiotypic vaccine.

136. (New) The vaccine according to claim 134, wherein said vaccine is formulated for administration via an oral, inhalation, topical or parenteral route.

137. (New) A vaccine comprising a peptide fragment according to claim 48 together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

138. (New) The vaccine according to claim 137, wherein said vaccine is an idiotypic vaccine.

139. (New) The vaccine according to claim 137, wherein said vaccine is formulated for administration via an oral, inhalation, topical or parenteral route.

140. (New) A vaccine comprising an antibody or fragment thereof according to claim 55, together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

141. (New) The vaccine according to claim 140, wherein said vaccine is an idiotypic vaccine.

142. (New) The vaccine according to claim 140, wherein said vaccine is formulated for administration via an oral, inhalation, topical or parenteral route.

143. (New) A method for inducing an immune response against disease in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the peptide fragment according to claim 48.

144. (New) The method according to claim 143, wherein the polypeptide, peptide fragment, or antibody, or fragment thereof, is administered together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

145. (New) A method for the treatment and/or prophylaxis of disease in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the peptide fragment according to claim 48.

146. (New) The method according to claim 143, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

147. (New) The method according to claim 143, wherein the disease is cancer.

148. (New) The method according to claim 147, wherein the cancer is selected from the group consisting of carcinogenic tumors; tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal tumors, such as sarcoma; and haemopoietic tumors, such as B cell lymphoma.

149. (New) A method for inducing an immune response against disease in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the antibody, or fragment thereof, according to claim 55.

150. (New) The method according to claim 149, wherein the polypeptide, peptide fragment, or antibody, or fragment thereof, is administered together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

151. (New) A method for the treatment and/or prophylaxis of disease in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the antibody, or fragment thereof, according to claim 55.

152. (New) The method according to claim 149, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

153. (New) The method according to claim 149, wherein the disease is cancer.

154. (New) The method according to claim 153, wherein the cancer is selected from the group consisting of carcinogenic tumors; tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal tumors, such as sarcoma; and haemopoietic tumors, such as B cell lymphoma.

155. (New) A method for inducing an immune response against disease in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the pharmaceutical composition according to claim 90.

156. (New) The method according to claim 155, wherein the polypeptide, peptide fragment, or antibody, or fragment thereof, is administered together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

157. (New) A method for the treatment and/or prophylaxis of disease in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the pharmaceutical composition according to claim 90.

158. (New) The method according to claim 155, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

159. (New) The method according to claim 155, wherein the disease is cancer.

160. (New) The method according to claim 159, wherein the cancer is selected from the group consisting of carcinogenic tumors; tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal tumors, such as sarcoma; and haemopoietic tumors, such as B cell lymphoma.

161. (New) A method for inducing an immune response against disease in a vertebrate, comprising administering to said vertebrate an immunologically effective amount of the vaccine according to claim 99

162. (New) The method according to claim 161, wherein the polypeptide, peptide fragment, or antibody, or fragment thereof, is administered together with a pharmaceutically acceptable carrier, adjuvant and/or diluent.

163. (New) A method for the treatment and/or prophylaxis of disease in a vertebrate in need of said treatment and/or prophylaxis, wherein said method comprises administering to said vertebrate a therapeutically effective amount of the vaccine according to claim 99.

164. (New) The method according to claim 161, wherein the disease is selected from the group consisting of cancer, rheumatoid arthritis and coronary heart disease.

165. (New) The method according to claim 161, wherein the disease is cancer.

166. (New) The method according to claim 165, wherein the cancer is selected from the group consisting of carcinogenic tumors; tumors of epithelial origin, such as colo-rectal cancer, breast cancer, lung cancer, head and neck tumors, hepatic cancer, pancreatic cancer, ovarian cancer, gastric cancer, brain cancer, bladder cancer, prostate cancer and urinary/genital tract cancer, oesophageal cancer; mesenchymal tumors, such as sarcoma; and haemopoietic tumors, such as B cell lymphoma.

167. (New) A method of gene therapy, wherein said method comprises:

(a) inserting a vector according to claim 75 into a host cell;

(b) expressing the nucleic acid sequence in the transformed cell.